



Billing Code: 5001-06

DEPARTMENT OF DEFENSE

Office of the Secretary

[Transmittal No. 17-80]

Arms Sales Notification

AGENCY: Defense Security Cooperation Agency, Department of Defense.

ACTION: Arms sales notice.

SUMMARY: The Department of Defense is publishing the unclassified text of an arms sales notification.

FOR FURTHER INFORMATION CONTACT: Pamela Young, (703) 697-9107, pamela.a.young14.civ@mail.mil or Kathy Valadez, (703) 697-9217, kathy.a.valadez.civ@mail.mil; DSCA/DSA-RAN.

SUPPLEMENTARY INFORMATION: This 36(b)(1) arms sales notification is published to fulfill the requirements of section 155 of Public Law 104-164 dated July 21, 1996. The following is a copy of a letter to the Speaker of the House of Representatives, Transmittal 17-80 with attached Policy Justification and Sensitivity of Technology.

Dated: January 23, 2018.

Aaron Siegel,

Alternate OSD Federal Register Liaison Officer,

Department of Defense.



DEFENSE SECURITY COOPERATION AGENCY

201 12TH STREET SOUTH, STE 203
ARLINGTON, VA 22202-5406

JAN 18 2018

The Honorable Paul D. Ryan
Speaker of the House
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Speaker:

Pursuant to the reporting requirements of Section 36(b)(1) of the Arms Export Control Act, as amended, we are forwarding herewith Transmittal No. 17-80, concerning the Air Force's proposed Letter(s) of Offer and Acceptance to the Government of Belgium for defense articles and services estimated to cost \$6.53 billion. After this letter is delivered to your office, we plan to issue a news release to notify the public of this proposed sale.

Sincerely,

A handwritten signature in black ink, appearing to read "Ch. Hooper", is written over the typed name.

Charles W. Hooper
Lieutenant General, USA
Director

Enclosures:

1. Transmittal
2. Policy Justification
3. Sensitivity of Technology



Transmittal No. 17-80

Notice of Proposed Issuance of Letter of Offer
Pursuant to Section 36(b)(1)
of the Arms Export Control Act, as amended

(i) Prospective Purchaser: Government of Belgium

(ii) Total Estimated Value:

Major Defense Equipment*	\$4.53 billion
Other	<u>\$2.00 billion</u>
TOTAL	\$6.53 billion

(iii) Description and Quantity or Quantities of Articles or Services under Consideration for Purchase:

Major Defense Equipment (MDE):

Thirty-four (34) F-35 Joint Strike Fighter Conventional Take Off and Landing (CTOL) Aircraft

Thirty-eight (38) Pratt & Whitney F-135 Engines (34 installed, 4 spares)

Non-MDE:

Also included are Electronic Warfare Systems; Command, Control, Communications, Computer and Intelligence/Communications, Navigational, and Identification (C4I/CNI); Autonomic Logistics Global Support System (ALGS); Autonomic Logistics Information System (ALIS); Full Mission Trainer; Weapons Employment Capability, and other Subsystems, Features, and Capabilities; F-35 unique infrared flares; Reprogramming center; F-35 Performance Based Logistics; software development/integration; aircraft ferry and tanker support; support equipment; tools and test equipment; communications equipment; spares and repair parts; personnel training and training equipment; publications and technical documents; U.S. Government and contractor engineering and logistics personnel services; and other related elements of logistics and program support.

(iv) Military Department: Air Force (BE-D-SAD)

(v) Prior Related Cases, if any: None

(vi) Sales Commission, Fee, etc., Paid, Offered, or Agreed to be Paid: None

(vii) Sensitivity of Technology Contained in the Defense Article or Defense Services Proposed to be Sold: See Attached Annex

(viii) Date Report Delivered to Congress: January 18, 2018

*As defined in Section 47(6) of the Arms Export Control Act.

POLICY JUSTIFICATION

Belgium - F-35 Joint Strike Fighter Aircraft

The Government of Belgium has requested to buy thirty-four (34) F-35 Joint Strike Fighter Conventional Take Off and Landing (CTOL) aircraft, and thirty-eight (38) Pratt & Whitney F-135 engines (34 installed, 4 spares). Also included are Electronic Warfare Systems; Command, Control, Communications, Computer and Intelligence/Communications, Navigational, and Identification (C4I/CNI); Autonomic Logistics Global Support System (ALGS); Autonomic Logistics Information System (ALIS); Full Mission Trainer; Weapons Employment Capability, and other Subsystems, Features, and Capabilities; F-35 unique infrared flares; Reprogramming center; F-35 Performance Based Logistics; software development/integration; aircraft ferry and tanker support; support equipment; tools and test equipment; communications equipment; spares and repair parts; personnel training and training equipment; publications and technical documents; U.S. Government and contractor engineering and logistics personnel services; and other related elements of logistics and program support. The estimated total case value is \$6.53 billion.

This proposed sale will contribute to the foreign policy and national security of the United States by helping to improve the security of an ally and partner nation which has been, and continues to be, an important force for political and economic stability in Western Europe.

This proposed sale of F-35s will provide Belgium with a credible defense capability to deter aggression in the region and ensure interoperability with U.S. forces. The proposed sale will augment Belgium's operational aircraft inventory and enhance its air-to-air and air-to-ground self-defense capability. Belgium will have no difficulty absorbing these aircraft into its armed forces.

The proposed sale of this equipment and support will not alter the basic military balance in the region.

The prime contractors will be Lockheed Martin Aeronautics Company, Fort Worth, TX; and Pratt & Whitney Military Engines, East Hartford, CT. This proposal is being offered in the context of a competition. If the proposal is accepted, it is expected that offset agreements will be required. All offsets are defined in negotiations between the Purchaser and the contractor.

Implementation of this proposed sale will require multiple trips to Belgium involving U.S. Government and contractor representatives for technical reviews/support, program management, and training over the life of the program. U.S. contractor representatives will be required in Belgium to conduct Contractor Engineering Technical Services (CETS) and Autonomic Logistics and Global Support (ALGS) for after-aircraft delivery.

There will be no adverse impact on U.S. defense readiness as a result of this proposed sale.

Transmittal No. 17-80

Notice of Proposed Issuance of Letter of Offer
Pursuant to Section 36(b)(1)
of the Arms Export Control Act

Annex
Item No. vii

(vii) Sensitivity of Technology:

1. The F-35 Conventional Take-Off and Landing (CTOL) Block 3 aircraft is classified SECRET, except as noted below. It contains current technology representing the F-35 low observable airframe/outer mold line, Pratt & Whitney engine, radar, integrated core processor central computer, mission systems/electronic warfare suite, a multiple sensor suite, operational flight and maintenance trainers, technical data/documentation, and associated software. As the aircraft and its subsystems are under development, many specific identifying equipment/system nomenclatures have not been assigned to date. Sensitive and classified elements of the F-35 CTOL Block 3 aircraft include hardware, accessories, components, and associated software for the following major subsystems:

- a. The Propulsion system is classified SECRET and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET. The single 40,000-lb thrust class engine is designed for low observability and has been integrated into the aircraft system. Pratt & Whitney, with the F-135, is developing and producing engine turbo machinery compatible with the F-35 and assures highly reliable, affordable performance. The engine is designed to be utilized in all F-35 variants, providing unmatched commonality and supportability throughout the worldwide base of F-35 users. The CTOL propulsion configuration consists of a main engine, diverterless supersonic inlet, and a Low Observable Axisymmetric Nozzle (LOAN).
- b. The AN/APG-81 Active Electronically Scanned Array (AESA) provides mission systems with air-to-air and air-to-ground tracks which the mission system uses as a component to sensor fusion. The AESA allows the radar to direct RF energy in a way that does not expose the F-35, allowing it to maintain low observability in high-threat environments. The radar subsystem supports integrated system performance for air-to-air missions by providing search, track, identification, and AIM-120 missile data link functionality. The radar also provides synthetic aperture radar mapping for locating surface targets and weather mapping for weather avoidance. The radar functions are tightly integrated, interleaved, and managed by an interface to sensor management functions within mission software. The hardware and software are classified SECRET.
- c. The Electro Optical Targeting System (EOTS) contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET. The EOTS subsystem to the sensor suite provides long-range detection and tracking, Infrared Search and Track (IRST)

capability, a Forward-Looking Infrared (FLIR) sensor for precision tracking, and Bomb Damage Indication (BDI) capability. EOTS replaces multiple separate internal or podded systems typically found on legacy aircraft. The functionality of the EOTS employs the following modes: Targeting FLIR; Laser Range-Finding and Target Designation; EO DAS and EOTS Performance.

d. The Electro-Optical Distributed Aperture System (EODAS) is a subsystem to the sensor suite and provides full spherical coverage for air-to-air and air-to-ground detection and Navigation Forward Looking Infrared (NFLIR) imaging. The system contains both SECRET and UNCLASSIFIED elements and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET. The NFLIR capability provides infrared (IR) imagery directly to the pilot's Helmet-Mounted Display (HMD) for navigation in total darkness, including takeoff and landing, and provides a passive IR input to the F-35's sensor fusion algorithms. The all-aspect missile warning function provides time-critical warnings of incoming missiles and cues other subsystems to provide effective countermeasure employment. EODAS also provides anIRST function that can create and maintain Situational Awareness-quality tracks (SAIRST). EODAS is a mid-wave Infrared (IR) system consisting of six identical sensors distributed around the F-35 aircraft. Each sensor has a corresponding airframe window panel integrated with the aircraft structure to meet aerodynamic and stealth requirements.

e. The Electronic Warfare (EW) system contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET. Sensitive elements include: apertures; radio frequency (RF) and infrared (IR) countermeasures; and Electronic Countermeasures (ECM) techniques and features. The reprogrammable, integrated system provides radar warning and electronic support measures (ESM) along with a fully integrated countermeasures (CM) system. The EW system is the primary subsystem used to enhance situational awareness, targeting support and self defense through the search, intercept, location and identification of in-band emitters and to automatically counter IR and RF threats. The IR and RF countermeasures are classified SECRET. This system uses low signature- embedded apertures, located in the aircraft control surface edges, to provide direction finding and identification of surface and airborne emitters and the geo-location of surface emitters. The system is classified SECRET.

f. The Command, Control, Communications, Computers and Intelligence/ Communications, Navigation, and Identification (C4I/CNI) system provides the pilot with unmatched connectivity to flight members, coalition forces, and the battlefield. It is an integrated subsystem designed to provide a broad spectrum of secure, anti-jam, covert voice and data communications, precision radio navigation and landing capability, self-identification, beyond visual range target identification, and connectivity with off-board sources of information. The functionality is tightly integrated within the mission system for enhanced efficiency and effectiveness in the areas of communications, navigation, identification, and sensor fusion. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET. The CNI function includes both SECRET and

UNCLASSIFIED elements. Sensitive elements of the CNI subsystems include:

- (1) The VHF/UHF Voice and Data (Plain and Secure) Communication functionality includes air-to-air UHF/VHF voice and data, both clear and secure, to provide communications with other friendly and coalition aircraft, air-to-ground UHF voice to provide communications with ground sites, and intercommunication voice and tone alerts to provide communications between the avionics system and the pilot. UHF/VHF downlink of air vehicle status and maintenance information is provided to notify the ground crews of the amounts and types of stores, fuel, and other supplies or equipment needed to quickly turn the aircraft for the next mission. The system contains both SECRET and UNCLASSIFIED elements and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.
- (2) The Tactical Air Navigation (TACAN) functionality provides operational modes to identify ground station and to provide bearing-to-station, slant range-to-ground station, bearing-to-airborne station and slant range to the nearest airborne station or aircraft. TACAN is not unique to the F-35 aircraft but is standard on most U.S. Air Force aircraft. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.
- (3) The Identification Friend or Foe Interrogator and Transponder Identification functionality consists of integrated Mark XII Identification Friend or Foe (IFF) transponder capability to provide identification of other friendly forces. The CNI system supports sensor fusion by supplying data from IFF interrogations and off-board sources through the intra-flight data link. The system contains both SECRET and UNCLASSIFIED elements and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.
- (4) The Global Positioning System Navigation functionality includes the Global Positioning System (GPS) aided inertial navigation to provide high-quality positional navigation, and the Instrument Landing System (ILS)/Tactical Air Control and Navigation (TACAN) to provide navigation and landing cues within controlled airspace. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.
- (5) The Multi-Function Advanced Data Link (MADL) is used specifically for communications between F-35 aircraft and has a very low probability of intercept, contributing to covert operations. The system contains both SECRET and UNCLASSIFIED elements and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.
- (6) The Inertial Navigation System is an all-attitude, Ring Laser Gyro-based navigation

system providing outputs of linear and angular acceleration, velocity, body angular rates, position, altitude (roll, pitch, and platform azimuth), magnetic and true heading, altitude, and time tags. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.

(7) The Radar Altimeter functionality is a module provided in the CNI system rack 3A and uses separate transmit and receive antennae. It measures and reports altitude, and altitude rate of change. Control data is transferred over to a configurable avionics interface card which translates the information to the F-35 aircraft computers. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.

(8) The Instrument Landing System (ILS) measures, and reports azimuth course and alignment, elevation course alignment, and distance to the runway. Data from the ILS is used to drive visual flight instrumentation. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.

(9) The Tactical Data Link is a secure broadcast Tactical Digital Information Link (TADIL) used for real-time voice/data exchange for command and control, relative navigation, and Precise Position Location Identification (PPLI), providing Link-16 type capabilities. The system contains both SECRET and UNCLASSIFIED elements and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is classified SECRET.

g. The F-35 Autonomic Logistics Global Sustainment (ALGS) includes both SECRET and UNCLASSIFIED elements. It provides a fully integrated logistics management solution. ALGS integrates a number of functional areas, including supply chain management, repair, support equipment, engine support, and training. The ALGS infrastructure employs a state-of-the-art information system that provides real-time, decision-worthy information for sustainment decisions by flight line personnel. Prognostic health monitoring technology is integrated with the air system and is crucial to the predictive maintenance of vital components.

h. The F-35 Autonomic Logistics Information System (ALIS) includes both SECRET and UNCLASSIFIED elements. The ALIS provides an intelligent information infrastructure that binds all of the key concepts of ALGS into an effective support system. ALIS establishes the appropriate interfaces among the F-35 Air Vehicle, the warfighter, the training system, government information technology (IT) systems, JSF operations, and supporting commercial enterprise systems. Additionally, ALIS provides a comprehensive tool for data collection and analysis, decision support, and action tracking.

i. The F-35 Training System includes both SECRET and UNCLASSIFIED elements. The Training System includes several types of training devices, to provide for integrated training of both pilots and maintainers. The pilot training device includes a Full Mission Simulator (FMS). The maintainer training devices include an Aircraft Systems Maintenance Trainer (ASMT), Ejection System Maintenance Trainer (ESMT), and

Weapons Loading Trainer (WLT). The F-35 Training System can be integrated, where both pilots and maintainers learn in the same Integrated Training Center (ITC).

Alternatively, the pilots and maintainers can train in separate facilities (Pilot Training Center and Maintenance Training Center).

j. Weapons employment capability is SECRET and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is SECRET. Software (object code) is classified SECRET. Sensitive elements include co-operative targeting.

k. Other Subsystems, Features, and Capabilities:

(1) The Low Observable Air Frame is SECRET and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is classified SECRET. Software (object code) is SECRET. Sensitive elements include: the Radar Cross Section and its corresponding plots, construction materials and fabrication.

(2) The Integrated Core Processor (ICP) Central Computer is SECRET and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is SECRET. Software (object code) is classified SECRET. Sensitive elements include: F-35 Integrated Core Processor utilizing Commercial Off-the-Shelf (COTS) Hardware and Module Design to maximize growth and allow for efficient management of DMS and Technology Insertion, if additional processing is needed, a second ICP will be installed in the space reserved for that purpose, more than doubling the current throughput and memory capacity.

(3) The F-35 Helmet Mounted Display System (HMDS) is SECRET and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is SECRET. Software (object code) is SECRET. Sensitive elements include: HMDS consists of the Display Management Computer-Helmet, a helmet shell/display module, a quick disconnect integrated as part of the ejection seat, helmet trackers and tracker processing, day- and night-vision camera functions, and dedicated system/graphics processing. The HMDS provides a fully sunlight readable, bi-ocular display presentation of aircraft information projected onto the pilot's helmet visor. The use of a night vision camera integrated into the helmet eliminates the need for separate Night Vision Goggles (NVG). The camera video is integrated with EO and IR imaging inputs and displayed on the pilot's visor to provide a comprehensive night operational capability.

(4) The Pilot Life Support System is SECRET and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is SECRET. Software (object code) is SECRET. Sensitive elements include: a measure of Pilot Chemical, Biological, and Radiological Protection through use of an On-Board Oxygen Generating System (OBOGS); and an escape system that provide additional protection to the pilot. OBOGS takes the Power and Thermal Management

System (PTMS) air and enriches it by removing gases (mainly nitrogen) by adsorption, thereby increasing the concentration of oxygen in the product gas and supplying breathable air to the pilot.

(5) The Off-Board Mission Support System is SECRET and contains technology representing the latest state-of-the-art in several areas. Information on performance and inherent vulnerabilities is SECRET. Software (object code) is SECRET. Sensitive elements include: mission planning, mission briefing, maintenance/intelligence/ tactical debriefing, sensor/algorithm planning, EW system reprogramming, data debrief, etc.

1. Publications: Manuals are considered SECRET as they contain information on aircraft/system performance and inherent vulnerabilities.

2. The JSF Reprogramming Center is classified SECRET and contains technology representing the latest state-of-the-art in several areas. This hardware/software facility is located in the U.S. and provides F-35 customers a means to update JSF electronic warfare databases. Sensitive elements include: EW software databases and tools to modify these databases.

3. (U) If a technologically advanced adversary were to obtain knowledge of specific hardware, the information could be used to develop countermeasures which might reduce weapons system effectiveness or be used in the development of a system with similar or advanced capabilities.

4. (U) A determination has been made that Belgium can provide substantially the same degree of protection for sensitive technology being released as the U.S. Government. This proposed sustainment program is necessary to the furtherance of the U.S. foreign policy and national security objectives outlined in the policy justification.

5. (U) All defense articles and services listed on this transmittal are authorized for release and export to the Government of Belgium.

[FR Doc. 2018-01432 Filed: 1/25/2018 8:45 am; Publication Date: 1/26/2018]